

Claims

[c1] A control system for an automotive vehicle having a steering actuator comprising:
a plurality of sensors generating a plurality of signals corresponding to a dynamic condition of the vehicle; and
a controller coupled to the plurality of sensors, said controller determining a lateral force in response to measured vehicle conditions, determining a slip angle in response to measured vehicle conditions, determining a first steering actuator angle change to decrease the slip angle until the lateral force increases, thereafter, determining a second steering actuator angle change to increase the slip angle until the lateral force decreases.

[c2] A system as recite in claim 1 wherein said steering actuator comprises a front right wheel actuator and a front left wheel actuator.

[c3] A system as recite in claim 2 wherein said front right wheel steering actuator and said front left steering actuator are independently controllable.

[c4] A system as recite in claim 3 wherein said controller generates a front right control signal and a front left control signal in determining a first steering actuator angle change and determining a second steering actuator angle change.

[c5] A system as recite in claim 1 wherein said steering actuator comprises a rear steering actuator and a front steering actuator.

[c6] A system as recite in claim 1 wherein said controller determines a rear steering control signal in determining a first steering actuator angle change and determining a second steering actuator angle change.

[c7] A method of controlling a vehicle having a steering actuator comprising:
determining a lateral force in response to measured vehicle conditions;
determining a slip angle in response to measured vehicle conditions;
determining a first steering actuator angle change to decrease the slip angle until the lateral force increases;
controlling the steering actuator in response to the first steering actuator

change angle; thereafter, determining a second steering actuator angle change to increase the slip angle until the lateral force decreases; and controlling the steering actuator in response to the second steering actuator change angle.

- [c8] A method as recited in claim 7 wherein determining a first steering actuator angle change to decrease the slip angle until the lateral force increases is performed independent of a handwheel position.
- [c9] A method as recited in claim 7 wherein controlling the steering actuator in response to the first steering actuator change angle and controlling the steering actuator in response to the second steering actuator change angle comprises controlling a front steering actuator.
- [c10] A method as recited in claim 7 wherein controlling the steering actuator in response to the first steering actuator change angle and controlling the steering actuator in response to the second steering actuator change angle comprises controlling a rear steering actuator.
- [c11] A method as recited in claim 7 wherein controlling the steering actuator in response to the first steering actuator change angle and controlling the steering actuator in response to the second steering actuator change angle comprises controlling a front right steering actuator.
- [c12] A method as recited in claim 7 wherein controlling the steering actuator in response to the first steering actuator change angle and controlling the steering actuator in response to the second steering actuator change angle comprises controlling a front left steering actuator.
- [c13] A method of controlling a vehicle having a steering actuator comprising: determining a lateral force in response to measured vehicle conditions; and controlling the steering actuator in response to the lateral force to maximize the lateral force.
- [c14] A method as recited in claim 13 wherein controlling the steering actuator

comprises changing a slip angle to maximize the lateral force.

[c15] A method as recited in claim 13 wherein controlling the steering actuator comprises changing a steering angle to increase the lateral force until the lateral force decreases, then changing the steering angle until the lateral force increases.